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ABSTRACT

The symposium focused on some problems and issues in the assessment of human personality traits and was planned around a research study being conducted by Educational Testing Service under contract with ONR. The study is trying to provide a service to researchers who are working (through the use of factor analysis) toward a theoretical basis in the personality domain. The idea for preparing the Proceedings developed in the course of the actual symposium. Included in the Proceedings are papers by: Lewis R. Goldberg, The Exploitation of the English Language for the Development of a Descriptive Personality Taxonomy; John W. French, The Identification of Personality Factors from a Systematic Review of the Literature; Diran Dermen, A Verification Study of 28 Self-Report Personality Factors; and Raymond B. Cattell, Factor Reference Kits and Personality Structure Theory. Also included in the Proceedings are comments by the two discussants: Joseph R. Royce and Donald W. Fiske. (Author)

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Symposium at American Psychological Association

Montreal, Canada August 1973

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Toward the Development of More Comprehensive Sets of Personality Measures

Harry H. Harman, Editor

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Symposium: Toward the Development of More Comprehensive Sets of Personality Measures

Harry H. Harman, Chairman

Introduction

The idea for preparing these Proceedings developed in the course of the actual Symposium. In addition to the formal parts of the Symposium, comments and questions were made by more than a half-dozen members of the audience and were discussed by the symposium participants. Unfortunately, members of the audience were not identified; questions were spontaneous and there was no recording equipment. To try to recapture from memory alone the questions and discussions would not do justice to the lively give-and-take that ensued, and hence it was deemed more advisable to leave out that part from these Proceedings.

General Remarks

This Symposium focuses on some problems and issues in the assessment of human personality traits. It approaches the problem of measuring individual differences from a broad theoretical basis and illustrates this approach with empirical findings. Both the conceptual and measurement aspects are subjected to critical appraisals.

As a point of departure, this symposium was planned around a research activity being conducted by ETS, with the partial assistance of ONR. That activity is trying to provide a service to researchers who are working (through the use of factor analysis) toward a theoretical basis in the personality domain. Such a service, in the form of a reference kit of tests, has existed for some time in the aptitude area. In the present work of extending this

service to a part of the personality domain it is important that it be judged in the perspective of broad personality structure theories.

Such perspective is introduced in the first paper by Goldberg who lays a general theoretical foundation and indicates how measures for the structural constructs of such a theory of personality are being developed. This is followed by two papers stemming out of the ETS project: (1) The first, by French, presents the technical "identification" of personality factors from a careful review of the literature and a rationalization of the problems and inconsistencies encountered; (2) the second, by Dermen, adds the empirical testing of the hypothesized personality factors. The final paper, by Cattell, provides a set of criteria or standards for good programmatic research--without which progress toward an eventual theory of personality would be elusive.

In the limited time available for this symposium we shall have to follow the restrictive format of having the four papers that are its nucleus presented without interruption, followed by brief commentaries from the two formal discussants, Dr. Fiske and Dr. Royce, and then it will be open for discussion from the floor. At a luncheon meeting of the symposium participants there was general agreement on the time required for each of the presentations, so that we hope to have 15-25 minutes available, and we do hope that you will want to enter into the discussion.

The Exploitation of the English Language for the Development of a Descriptive Personality Taxonomy

Lewis R. Goldberg

University of Oregon and Oregon Research Institute

Perhaps the most fundamental--and certainly the most ambitious--goal of personality research is the identification of the most important individual differences in mankind. These central individual differences, as distilled from the enormous variety which are manifested, should provide the structural constructs for an eventual theory of personality, as well as the targets for the development of new personality measures. While attempts have long been made to systematize personality differences, the most promising of the empirical approaches to this enormous task have been based on one critical assumption: namely, that those individual differences that are of the most significance in the daily transactions of persons with each other will eventually become encoded into the natural language as single-word trait descriptors (Goldberg, 1972).

The first serious attempt to exploit the natural language to construct a comprehensive personality taxonomy was carried out by Raymond Cattell, who noted that:

> ". . . the first source--and the only immediately practicable one--for a 'total realm' of personality traits is to be found in language. Over the centuries, by the pressure of urgent necessity, every aspect of one human being's behavior that is likely to affect another has come to be handled by some verbal symbol--at least in any developed modern language. Although some new

words for traits constantly appear, a debris of equivalent but obsolete words constantly falls from the language [Cattell, 1957; p. 71]."

". . . by contrast, the area of the personality which does not bear on other people, which deals with the physical world, and in a way not relevant to the interests of society, will be sparsely and incompletely populated with trait terms. If chairs and automobiles and cheeses had tongues, we should doubtless find trait terms for light and heavy sitters, for a wide variety of gear changers, and for the varying behavior of digestive organs. The trait vocabularies of modern languages, therefore, may be expected to cover, with reasonable completeness and efficiency, patterns and elements of behavior as seen from the standpoint of man, but not as seen from the standpoint of nature [Cattell, 1943; p. 486]."

"The position we shall adopt is a very direct one . . . making only the one assumption that all aspects of human personality which are or have been of importance, interest, or utility have already become recorded in the substance of language. For, throughout history, the most fascinating subject of general discourse, and also that in which it has been most vitally necessary to have adequate, representative symbolism, has been human behavior. Necessity could not possibly be barren where so little apparatus is required to permit the birth of invention [Cattell, 1943; p. 483]."

Allport and Odbert (1936) culled some 18,000 person-descriptive terms from Webster's Second Unabridged Dictionary and grouped them into four lists: (a) a set of metaphorical or doubtful terms; two sets of terms referring to (b) social evaluations and (c) temporary states; and, finally, (d) some 4500 terms that they deemed were descriptive of "real personal traits." Recently, the original Allport-Odbert list of trait descriptors has been expanded and updated by Warren Norman, on the basis of a comprehensive survey of Webster's Third Unabridged Dictionary. Norman has stated that:

> "The basic commitment which underlies this research effort is that the eventual construction of more effective theories of the development, structure, and functioning of personality--and the formulation of more adequate procedures for the selection, classification, and evaluation of personnel--will be facilitated by having available a well-organized and extensive vocabulary by means of which to denote phenotypic attributes of persons. It is also assumed that the eventual development of psychometrically adequate methods and devices for the assessment of personality characteristics will be markedly aided by the availability of a comprehensive and clearly articulated taxonomy of trait descriptive terms [Norman, 1967; p. 1]."

Each of the 18,125 terms in Norman's new pool has been classified by his research team either into one of 11 "inclusion" or into one of 5 "exclusion" categories. A brief summary of this initial catalogue is presented in Table 1. Less than 3000 (or about 15%) of the 18,125 terms appear to

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Insert Table 1 about here

---

refer to stable traits (e.g., "meek"), another 3000 to temporary states or activities (e.g., "lonesome"), and roughly half that number (about 1500 terms) to social roles, relationships, or effects (e.g., "dangerous"). Approximately 60% of the total collection can be viewed as dross, either because the terms have only minimal descriptive significance or because they are so arcane, ambiguous, vague, metaphorical, or obscure that their personological implications are available only to the most fanatic of lexicographers.

Table 2 presents a more detailed breakdown of Norman's catalogue, including an analysis of the 300 items in Gough's popular Adjective Check List (ACL). Roughly 80% of the ACL items were classified as stable traits by the Norman team, while 7% were classified as temporary states. Interestingly,

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Insert Table 2 about here

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over 8% of the ACL terms were assigned to one of Norman's exclusion categories, most on the grounds that they were personologically ambiguous (e.g., dull, mature, weak).

For the past few years, the assessment team at Oregon Research Institute has been collaborating with Dr. Norman on this taxonomic venture. Our goal is to develop a compelling structure--or a set of equally-compelling alternative structures--independently for each of the three major "inclusion" pools (Traits [I], States [II], and Effects [III]), and then to relate the constructs in these three taxonomies both to each other and to structures based upon other types of stimuli (e.g., the more complex--albeit more traditional--personality inventory items that were used in the ETS taxonomy project). Finally, we intend to replicate at least the most alluring findings from this long-term endeavor using other natural languages (including

some nonIndo-European languages such as Turkish and Hebrew).

To date, we have concentrated our attention on those terms which refer to stable traits (Category I in Table 1). Each of these terms has been administered to samples of university students (each sample composed of 50 males and 50 females) to determine its ambiguity and/or definitional difficulty, its social desirability, and its applicability (or endorsement frequencies), both in self-description and in peer description (Norman, 1967). On the basis of these and other data, the set of 3000 terms has been found to be easily prunable; approximately half of the initial set of terms are extremely difficult even for the college educated. Consequently we begin the taxonomic gameplan with around 1500 players; Warren Norman has attempted to cluster a set of 1566 terms, and I have been working with a somewhat expanded pool of approximately 1700.

Ultimately, we will have generated a family of competing structures, from which we--and others--will be able to select the most compelling. Some of these initial structures will be hierarchical in form, others will be dimensional; that is, we will be employing both hierarchical clustering and factor analytic algorithms. The structures will be generated from four major sources: (a) judgments of similarity of word meaning, (b) analyses of lexicographic materials (e.g., the Synonym Finder), (c) self-ratings, and (d) peer ratings. Competing structures will be evaluated in terms of their similarity across these four data sources. We will consider a structure as compelling if (a) it is aesthetically pleasing, (b) it is intuitively logical in the light of known facts about the domain, and (c) several sensible methods converge on that same solution.

Since most psychologists have at least some rough idea of the procedures involved in obtaining structures via factor or cluster analyses of self and peer ratings, I will focus primarily on those that we are generating by less conventional means. This aspect of the research problem may be reformulated in the following terms: Given what we think we know about language--specifically about the semantics of personality trait terms--can we apply any psycholinguistic principles in order to make our taxonomic task more manageable? Or, alternatively, can we use our existing knowledge in this realm to help generate an initial taxonomy, against which the empirical structures can then be compared?

The most intriguing kind of answer to these questions has come from the efforts of Dean Peabody at Swarthmore College to unconfound the influences of evaluation and description in personality trait attribution. Peabody's theoretical scheme is based on the assumption that, in the natural language, there exist sets of interrelated trait-terms which are used to describe differences in the intensity or the frequency of the same basic behavioral pattern. For example, consider individual differences in "generosity" (or, alternatively, in possessiveness with regard to one's money and property). While one can use adverbs to scale these differences (e.g., "very generous," "quite generous," "a bit generous," etc.), one can alternatively use single terms which embody such differences in degree (e.g., "generous," "philanthropic," "lavish," "extravagant," "wasteful").

Moreover, for many types of behavioral patterns, it appears that there is an important relationship between the extremity of the behavior described and the rated social desirability of the trait-descriptor. Specifically, more extreme terms are typically judged as less desirable (e.g., it is good

to be "generous," but it is bad to be "too generous" or "over-generous" or "extravagant"). For some--but not all--behavioral patterns, it is possible to find four types of trait-descriptive terms, and these are illustrated in the top portion of Table 3. Some terms are used to describe persons manifesting a "proper" amount of a trait, X, while others are used to describe persons

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Insert Table 3 about here

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manifesting a "proper" amount of the antonym of X, or Y. Moreover, we can also often find terms used to describe persons who are judged too extreme in either direction. To return to our original example, "generous" and "thrifty" can be viewed as describing two positions on the "generosity vs. possessiveness" continuum, "generous" being good and X-ish, "thrifty" being good and Y-ish. Thus, we can now scale four terms on this continuum: "over-generous," "generous," "thrifty," "over-thrifty." Alternatively, one might substitute the terms: "extravagant," "generous," "thrifty," and "stingy."

Table 4 presents this basic paradigm as I have been using it to classify some 1700 trait descriptive terms. In the top part of the table, you can see

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Insert Table 4 about here

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the illustrative trait descriptor "hippity" and its antonym "hoppity," both of which are evaluated positively. The opposite, or negation, of "hippity"--that is, "unhippity," "nonhippity," "inhippity," "hippityless," etc.--will typically be reversed, both descriptively and evaluatively, and thus can be found in the opposite corner of the table. Near that same location will be terms that describe an excess of "hoppityness"--that is, "overhoppity" or

"hyperhoppity." All of these terms make up a nuclear trait cluster: the original root word, plus all its synonyms: antonyms of the root word and of the synonyms (plus the synonyms of the antonyms); all reversals of these terms; all terms which denote varying positions on the same trait, especially those that denote too much ("over-") or too little ("under-"), of the trait; and all synonyms and antonyms of the latter terms.

In Table 4, this scheme is applied for fun to one of the most potent of traits: PASSION. Terms denoting various degrees of passion--from virtually none at all ("passionless," "dissensualized") to even more than enough ("lecherous," "lewd") are ordered in the table by their average social desirability. These mean values, on a scale from 1 (least desirable) to 9 (most desirable), are based on the ratings from 50 male and 50 female college students (Norman, 1967). Terms that denote an excess amount of the trait are listed a bit to the left of the root terms, while terms denoting the reversal of root terms are offset a bit to the right. In this and subsequent tables, a line is used to separate the desirable terms (mean values from 5 to 9) from the undesirable ones (mean values from 1 to 5). As you can see, it is terribly bad to be either "lecherous" or "passionless," quite bad to be either "lustless" or "unchaste," not so desirable to be either "unvoluptuous" or "overpassionate," good to be either "voluptuous" or "chaste," and best to be either "amorous" or "unadulterous." The example in Table 4 is presented more for its prurience than for its typicality. In fact, the example includes a quite unusual word pair, "lustful" and "lustless," both of which have low desirability values. In general, a root word and its reversal are quite dissimilar in evaluation--this being one of the rare exceptions.

Let us turn now to a less zany sort of nuclear trait cluster, namely the one I have already used as an example. Table 5 shows the application of the schema to the concept of "generosity;" terms indicating a propensity

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Insert Table 5 about here

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for giving or sharing are listed on the right, those suggesting a propensity for retaining are listed on the left. As one moves down the page, from the top to the bottom, the terms become increasingly less desirable. Note that the word set is not completely balanced or symmetrical: there are no terms to express frugality with quite the same degree of desirability as are the opposite terms "generous" and "charitable." And, there are no terms to express an excess of generosity with quite the same degree of undesirability as the opposite term, "greedy." That is, the concept of generosity, as it is embedded in the English language, is somewhat confounded with evaluation, although it can be unconfounded by an appropriate selection of terms from the nuclear trait set. Most traits show at least some such confounding, with far more terms in two diagonal cells (e.g., upper left and lower right) than in the other two cells (e.g., upper right and lower left). Indeed, there are, unfortunately, some concepts that are so completely confounded with evaluation that they include <u>only</u> terms in two diagonal cells. For example I know of no single English word to express the notion of too much intelligence ("overintelligent").

Table 6 presents another preliminary nuclear trait cluster, namely the

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Insert Table 6 about here

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propensity for taking risks. Risky terms are listed on the right, while

cautious ones are listed on the left. Note that there are plenty of "over-" terms (e.g., "overcautious," "overbold"), all of them undesirable. And, once again, there is a slight confounding with evaluation: there are far more positive terms to express riskiness than to express cautiousness: to be "careful" is to be very good, but not quite as good as it is to be "courageous;" and, to be "overrash" is to be quite bad, but not quite as terrible as it is to be "cowardly."

Table 7 illustrates the application of this schema to one of the most

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Insert Table 7 about here

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central concepts in personality research, namely Self-confidence or Self-esteem. Self-esteem is an example of a construct with differential variance in the desirability of terms defining each of its two poles. Specifically, it is very desirable to be "confident," "self-respecting," or "assured," while it is very undesirable to be "bigheaded," "boastful," "swellheaded," or "stuck-up." In contrast, the range of desirability values for the "humble" pole of this construct ("self-critical" to "prideless") appears to be considerably less extreme. Moreover, this schema could help to unravel some of the seeming inconsistencies in past research on the self-concept. For, as Table 7 should make clear, there are at least two distinct varieties of self-esteem: (a) some persons tend to endorse the terms on the right (e.g., "self-confident," "egotistical") while others tend to endorse the ones on the left (e.g., "humble," "self-deprecating"); and (b) some persons tend to endorse the terms above the line (e.g., "humble," "self-confident"), while others tend to endorse the ones below it (e.g., "self-deprecating," "egotistical"). The former are saying that they are confident (or not) in a content-consistent manner;

different indices of self-esteem include differential amalgams of these two processes, they should serve to produce inconsistent empirical findings.

Table 8 illustrates an application of this schema to a related construct, Culture. This example of a cluster, with which I am far from satisfied, can

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Insert Table 8 about here

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be used to illuminate some of the problems we confront in developing an intuitively-based structure. First of all, once again we encounter a confounding with evaluation: there are many more terms to describe a highly evaluated and well-socialized person (e.g., "tasteful," "mannerly," "poised," "refined," "suave," "urbane") than to describe a highly-evaluated but less-cultured one (e.g., "earthy"). Moreover, terms in the bottom right hand corner of Table 8 (e.g., "snooty," "snobbish") appear to be alarmingly similar to those terms in the same section of Table 7 (e.g., "affected," "vain," "conceited," "swell-headed"). In fact, one such term, "stuck-up," keeps wandering back and forth between the two clusters.

Finally, Table 9 presents the terms which scale the concept of Religiosity, illustrating the application of the schema to a concept typically treated as an attitude rather than a more global personality trait. Even here, there is a slight asymmetry vis-a-vis evaluation: there are more terms

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Insert Table 9 about here

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to denote a positively-regarded religious person than to denote a positively-regarded atheist. On the other hand, for this demension, like that of Masculinity-Femininity, one has to interpret those social desirability mean values

with caution: religious persons evaluate the religious words much more highly than non-religious persons, just as males evaluate the male-related terms (e.g., "masculine") more highly than do females. The range of desirability values presented in Table 9 is attenuated by the fact that two quite distinct types of persons are merged together.

Table 10 presents a summary of the 47 initial clusters included in this

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Insert Table 10 about here

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preliminary, and still very roughcut, taxonomic scheme. Some of the largest clusters should probably be further subdivided, among them being Assertiveness (134 terms), Spirit (100 terms), Temper (96 terms), Honesty (74 terms), Culture (74 terms), Conscientiousness (70 terms), Risk-taking (66 terms), Impulse Control (65 terms), and Self-esteem (60 terms). Some of the smallest clusters may eventually be merged together, for example Introspection (15 terms) and Contemplation (13 terms), Analyticalness (9 terms) and Objectivity (13 terms), and perhaps even Perceptiveness (17 terms) and Foresight (13 terms). Clearly, we still have a long way yet to go, and this summary is but a promissory note against our future efforts. Hopefully, however, this brief report may enveigle a few adventurous travelers to join us along the way.

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H A N D O U T

TABLE 1

The Initial Catalogue of 18,125 English Words

(after Norman, 1967)

	Number	%	Example
I. Stable ("Biophysical") Traits	2797	.15	Meek
II. Temporary States or Activities	3021	.17	Lonesome
III. Social Roles, Relationships, or Effects	1476	.08	Dangerous
(Total: I, II, and III)	(7294)	(.40)	
Exclusion Categories			
(a) Almost purely evaluative	760	.04	Nice
(b) Anatomical, physical, or medical	882	.05	Hairy
(c) Ambiguous, vague, or metaphorical	4796	.26	Oceanic
(d) Obscure; little-known	3606	.20	Bevering
(e) Other; miscellaneous	787	.04	
(Total excluded)	(10,831)	(.60)	

Source: Norman, W. T. 2800 personality trait descriptors: Normative operating characteristics for a university population. Department of Psychology, University of Michigan; Unpublished Technical Report; April, 1967.

(See also: Allport, G. W., & Odbert, H. S. Trait-names: A psycho-lexical study. Psychological Monographs, 1936, 47 (1, Whole No. 211).)

TABLE 2

A Classification of the 300 Terms in Gough's Adjective Check List (ACL)

According to the Rubrics Used by Norman to Refine his Initial Pool of 18,125 Terms

		No. in Category	No. of ACL Terms	ACL Examples
Stable "Biophysical" Traits	Category 1: Prime terms	608 (3%)	192 (64%)	calm, quiet, wise
	Category 2: Difficult terms	544 (3%)	6 (2%)	autocratic, frivolous, stolid
	Category 3: Slangy, quaint, awkward or colloquial	1645 (9%)	38 (13%)	cool, sexy, zany
	Category 3*: Excluded terms	787 (4%)	2 (1%)	conservative, rattle-brained
Temporary States and Activities	Category 4: Prime terms: States	384 (2%)	15 (5%)	confused, gloomy, tense
	Category 5: Prime terms: Activities	583 (3%)	4 (1%)	demanding, praising, quitting
	Category 6: Difficult terms	399 (2%)	1	despondent
	Category 7: Slangy, quaint, awkward or colloquial	1655 (9%)	1	anxious
Social Roles, Relationships, and Effects	Category 8: Prime terms: Roles	242 (1%)	1	dominant
	Category 9: Prime terms: Effects	163 (1%)	3 (1%)	attractive, charming, humorous
	Category 10: Difficult terms	163 (1%)	0	
	Category 11: Slangy, quaint, awkward or colloquial	908 (5%)	0	
Exclusion Categories	Category 12: Evaluative terms	760 (4%)	6 (2%)	capable, foolish, peculiar
	Category 13: Physical, medical, or grooming terms	882 (5%)	5 (2%)	handsome, healthy, strong
	Category 14: Ambiguous or metaphorical terms	4796 (26%)	14 (5%)	dull, mature, weak
	Category 15: Very difficult or obscure terms	3606 (20%)	0	
Total		18,125 (100%)	288*(96%)	

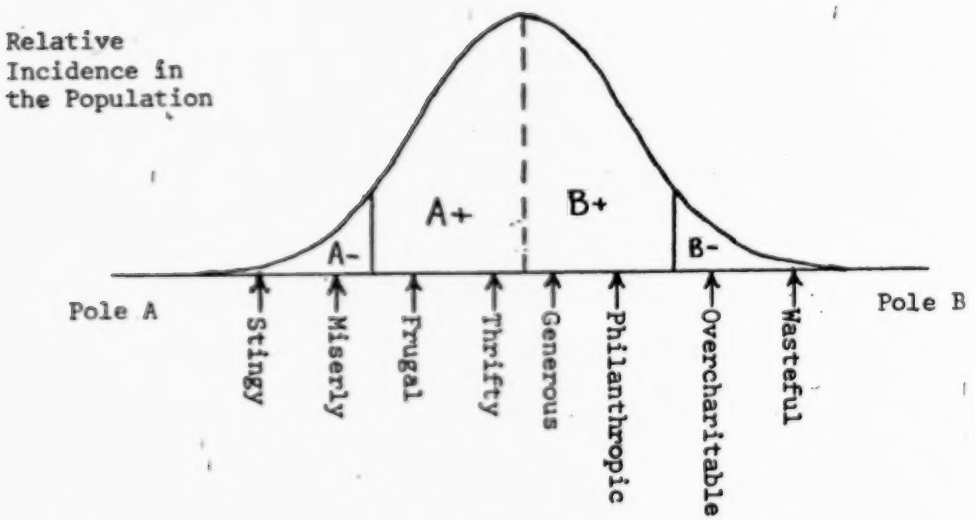
*Twelve terms in the ACL are not included in Norman's Master List: clear-thinking, defensive, egotistical, interests narrow, interests broad, opportunistic, organized, peaceable, pleasure-seeking, self-punishing, unaffected, and unrealistic.

TABLE 3

Scheme for Unconfounding Evaluation and Description

(after Peabody, 1967)

	Descriptive Attribute	
Evaluation	X	Non-X
Positive (+)	Thrifty	Generous
Negative (-)	Stingy	Extravagant



Descriptive Attribute

(e.g., Tendency to share one's possessions)

Source: Peabody, D. Trait inferences: Evaluative and descriptive aspects. Journal of Personality and Social Psychology Monograph, 1967, 7 (4, Whole No. 644).

TABLE 4

Application of the Scheme to the Classification of the Set of Trait-Descriptive Adjectives

The Basic Paradigm:

	Evaluation	
Hippity	(high)	Hoppity
(neutral)		
Unhoppity		Unhippity
Overhippity	(low)	Overhoppity

An example: PASSION

	Mean Desirability[a]	
	6.6	Amorous
	6.6	Passionate
Unadulterous	6.4	
	6.0	Sensual
	6.0	Sexy
Chaste	5.9	
	5.8	Voluptuous
	5.7	Sensuous
Virginal	5.4	Lusty
	4.9	Flirtatious
	4.4	Overpassionate
	4.2	Sultry
Unvoluptuous	4.1	
	3.8	Hot-blooded
	3.8	Hypersensual
	3.8	Unchaste
Insensuous	3.7	Lustful
Lustless	3.5	
Strait-laced	3.5	
	3.4	Overlusty
Puritanical	3.2	
Prudish	3.0	
	2.9	Lewd
	2.8	Adulterous
Dissensualized	2.6	
Passionless	2.5	
	2.2	Lecherous

[a] Average social desirability scale value, on a scale from 1 (least desirable) to 9 (most desirable), based on the ratings from 50 male and 50 female college students (Norman, 1967).

TABLE 5

GENEROSITY

	Mean Desirability	
	7.8	Generous
	7.8	Charitable
	7.1	Unniggardly
Economical	7.0	
Thrifty	6.7	
	6.6	Philanthropic
Unwasteful	6.5	
	6.0	Unmercenary
Frugal	5.7	
Unextravagant	5.4	
	4.8	Lavish
	4.7	Overcharitable
	4.2	Unthrifty
Possessive	3.9	
	3.8	Unfrugal
	3.8	Extravagant
Closefisted	3.6	Uneconomical
Unphilanthropic	3.3	
	3.2	Thriftless
Mercenary	3.1	
Covetous	2.9	Wasteful
Miserly	2.7	
Uncharitable	2.4	
Niggardly	2.4	
Ungenerous	2.3	
Stingy	2.2	
Greedy	2.0	
Overgreedy	1.7	

TABLE 6

RISK-TAKING

	Mean Desirability	
	8.0	Courageous
	7.6	Brave
Careful	7.4	
	7.3	Venturous
	7.2	Venturesome
	7.1	Adventurous
	7.0	Stout-hearted
	7.0	Fearless
	7.0	Valiant
	7.0	Gallant
Heedful	6.9	Heroic
Prudent	6.9	
	6.7	Daring
	6.7	Spunky
Cautious	6.6	Lion-hearted
	6.5	Dauntless
	6.5	Unfearing
	6.2	Plucky
	6.2	Valorous
	6.0	Bold
	5.9	Gutsy
	5.9	Forward
Wary	5.6	
	5.4	Devil-may-care
	4.5	Impetuous
	4.5	Overvaliant
	4.5	Saucy
	4.4	Headlong
Unheroic	4.2	
Unbold	4.2	Uncautious
Tentative	4.2	Overbrave
	4.1	Aweless
Overcareful	4.0	Brash
Overwary	4.0	Unwary
	4.0	Overdaring
	3.9	Audacious
	3.8	Incautious
	3.8	Overbold
Overcautious	3.7	Nervy
Unvaliant	3.6	Cocky
Timid	3.5	
Timorous	3.5	
Ungallant	3.4	Overforward
Unventurous	3.0	Imprudent
	3.0	Foolhardy
Overfearful	2.9	Rash
Unadventurous	2.9	Brazen
Weak-hearted	2.8	Reckless
Weak-kneed	2.8	
	2.6	Overrash
Gutless	2.3	
Cowardly	2.0	

TABLE 7

SELF ESTEEM

	Mean Desirability	
	8.1	Confident
	7.9	Self-respecting
	7.8	Self-reliant
	7.7	Self-confident
	7.4	Assured
	7.2	Self-sufficient
	7.1	Self-assured
Self-critical	7.0	
Unvain	6.9	
Unboastful	6.8	
Conceitless	6.8	Unselfconscious
Humble	6.7	Proud
Nonegotistical	6.7	
	6.5	Unshy
	6.2	Unbashful
Unpresuming	6.0	Self-satisfied
Unassuming	5.7	
Boastless	5.7	
	5.6	Unmeek
	4.7	Self-righteous
	4.5	Complacent
Self-conscious	4.4	
Self-doubting	4.3	
Shy	4.2	
Bashful	4.2	
Overmodest	4.1	Self-possessed
	4.0	Self-important
Meek	3.9	
Self-disparaging	3.8	
	3.7	Overconfident
Self-effacing	3.5	Egocentric
Unassured	3.4	Oversure
Unsure	3.3	Immodest
Insecure	3.2	Egotistic
Self-deprecating	3.2	
Unconfident	3.1	Self-centered
	3.1	Pretentious
	2.8	Overproud
	2.8	Affected
Prideless	2.7	Vain
	2.6	Conceited
	2.6	Smug
	2.5	Bigheaded
	2.4	Boastful
	2.3	Swellheaded
	2.0	Stuck-up

TABLE 8

CULTURE

	Mean Desirability	
	8.0	Civilized
	7.8	Tasteful
	7.5	Cultivated
	7.4	Mannerly
	7.4	Poised
	7.4	Cultured
Down-to-earth	7.0	Polished
	6.9	Dignified
Unpretentious	6.8	Chic
	6.7	Debonair
	6.6	Refined
	6.5	Sophisticated
	6.3	Suave
	6.2	Cosmopolitan
	6.1	Courtly
Earthy	5.9	
	5.7	Unprovincial
	5.7	Urbane
Homespun	5.2	
	4.7	Patronizing
Provincial	4.5	
Unsophisticated	3.9	
	3.7	Overrefined
	3.6	Condescending
Unpolished	3.4	Blase
Undignified	3.3	
Unpoised	3.2	
	3.1	High-faluting
	3.1	Pompous
Uncultivated	3.0	
Untasteful	2.9	
Unrefined	2.8	
Uncultured	2.7	
	2.6	Haughty
	2.6	Stuffy
Unmannered	2.5	
Uncivilized	2.5	
Vulgar	2.4	
Course	2.4	
Tasteless	2.4	
Uncouth	2.3	
Boorish	2.2	Snooty
	2.0	Snobbish

TABLE 9

RELIGION

	Mean Desirability	
	6.6	Religious
	6.5	God-fearing
Worldly	6.3	Spiritual
Worldly-minded	6.1	Reverent
	6.0	Devout
Earthly-minded	5.7	
	5.3	Saintly
	5.2	Mystical
	5.1	Other-worldly

	4.9	Pious
	4.8	Worshipful
Unsaintly	4.7	
Undevout	4.6	
Unreligious	4.5	
Unspiritual	4.3	Unworldly
Materialistic	4.2	
	4.0	Ultraspiritual
Impious	3.9	
Nonreligious	3.7	
Heretical	3.6	
	3.5	Ultrareligious
Mundane	3.4	
Nonspiritual	3.3	
Irreligious	3.2	
Godless	3.0	
Profane	2.7	
Irreverent	2.7	
Blasphemous	2.3	

TABLE 10

The Number of Terms in Each of the Preliminary Sets

	Construct	A-	A+	B+	B-	Total
1.	Risk Taking	18	5	21	22	66
2.	Spirit	33	6	48	13	100
3.	Impulse Control	18	23	14	10	65
4.	Self Esteem	16	11	14	19	60
5.	Predictability	3	3	4	8	18
5'.	Loyalty	4	0	3	0	7
6.	Assertiveness	26	25	23	60	134
7.	Aggression	6	7	3	34	50
8.	Envy	0	7	0	20	27
9.	Self Indulgence	3	4	2	7	16
10.	Generosity	13	6	5	8	32
11.	Nurturance	10	0	24	4	38
12.	Friendliness	32	0	21	0	53
13.	Trust	8	2	8	9	27
14.	Criticalness	2	13	5	32	52
15.	Dogmatism	1	16	0	15	32
16.	Respect	30	0	20	0	50
17.	Warmth	18	1	16	5	40
18.	Temper	14	30	6	46	96
19.	Speaking Style	10	14	11	8	43
20.	Gossip Proneness	2	3	2	9	16
22.	Verbosity	9	1	3	8	21
23.	Sarcasm	0	0	1	16	17
25.	Nervousness	0	1	3	22	26
26.	Toughness	15	1	14	3	33
27.	Neatness	5	0	6	11	22
28.	Honesty	37	4	27	6	74
29.	Activity Level	14	1	15	5	35
30.	Ambition	16	3	11	4	34
31.	Conscientiousness	33	0	29	8	70
32.	Culture	26	4	28	16	74
33.	Religion	16	3	9	5	33
34.	Passion	8	3	8	11	30
35.	Introspection	3	1	8	3	15
36.	Contemplation	3	0	8	2	13
37.	Analyticalness	4	1	3	1	9
38.	Objectivity	3	3	5	2	13
39.	Perceptiveness	8	0	9	0	17
40.	Foresight	4	0	9	0	13
41.	Curiosity	10	0	8	3	21
42.	Versatility	1	0	3	0	4
43.	Originality	5	0	6	1	12
44.	Depth	8	0	5	0	13
45.	Intelligence	9	0	7	0	16
46.	Achievement	15	0	10	1	26
47.	Gender	4	5	3	4	16
		523	207	488	461	1679
48.	Unclassified					29
	(Values)					(8)
	(Maturity)					(4)
	(Conservatism)					(4)
	(Transparency)					(5)
	(Other)					(8)
						1708

The Identification of Personality Factors From A Systematic Review of The Literature

John W. French

We have just been shown how it has been possible to extract a broad set of personality dimensions for human beings from a scrutinization of the language of personality that human beings have developed over the centuries. Now let's carry that logic through another step. Rather than spotting a wide coverage of personality dimensions, we are now going to look more specifically at those personality dimensions that have been tested and identified as factors. To do this, we will scrutinize the factors that researchers have published, mainly in journal articles. The personality items or scales used as variables in these analyses are quoted or described, albeit sometimes rather briefly or carelessly; they are intercorrelated and factored by a variety of methods; and the resulting factors are interpreted by the authors in the light of particular hypotheses, special backgrounds, or in individualized settings that happened to have been used in former analyses by the same investigator. Ah! That's the perplexity that arises so often! One factor analyst finds repeatedly that items A and B always load on factor C. Another finds again and again that items X and Y always load on factor Z. Each one chortles about the splendors of factorial invariance, the delights of consistent results, and the seemingly obvious conclusion that there could be no other possible interpretation of this important niche within the domain of personality. However, the reader who has seen both reports feels less joyful about consistency and invariance. Item A is pretty much like item X, and item B is pretty much like item Y, but not quite. Factor C is pretty much like factor Z, I think, but I wonder if the college students used as subjects in the

first analysis read the same meanings into items A and B that the prison inmates, for example, saw in items X and Y. There are a lot of fuzzy variables here being influenced by a lot of furry conditions. I guess I have to kick myself a little for ever looking down on clinical diagnoses just because I thought they lacked scientific rigor. There is not much rigor involved in trying to combine findings in the factor analysis literature. More identical sets of variables should be used in more analyses along with new variables. That's what this Kit is all about.

Now I will outline the procedures in the literature search, and then I will take you right along with me into a few of the more difficult decisions or interpretations that we have had to make in the course of formulating hypotheses with regard to the variables that would best represent the variables in the literature and the factors that those variables will be most likely to load when used in new analyses. I like to call this a process for arriving at a consensus of the literature.

The literature is big but irregular in quality, content, and relevance to this project. Therefore, we had to recognize three limitations to our survey as follows:

Limitation No. 1: The factors of interest are those that concern reasonably general temperamental traits of human beings. Cognitive factors are being handled separately. "Non-cognitive" is a term that is a little too broad for us, because we are not going to cover psycho-motor or physical characteristics, and we only plan to cover interests and values in so far as they help to measure temperamental traits. Interest factors are simply too numerous and too interlocking. There is also a rather large literature on human traits that are too specific for our purposes. Sometimes it is difficult to separate articles about such traits from those that are pertinent for us, because both

will often appear together. We can use evidence about general traits, but we have left out such things as: kinds of reaction to human pain, influences on the recognition of facial expressions, behavior patterns among teachers in the classroom, responses to various kinds of conflict situations, and kinds of behavior demonstrated under hypnosis.

Limitation No. 2: The factors of interest to us are those found in normal subjects rather than in psychiatric patients. Admittedly, this is a limitation of convenience. Certainly there are some psychologists who consider, say, Psychotic Tendency to be a more important factor than many of the factors we will include. However, it will be omitted, because it has not been established with any subjects other than psychiatric patients. A kit of self-report questionnaires is likely to be most usable with normal persons. Besides, it would take a person with clinical or psychiatric experience to interpret properly the factors that are special to psychiatric patients. I, for one, don't have that experience. A substantial number of studies have obtained data from both psychiatric patients and normals. Such studies are being covered in our survey unless the proportion of normals is so small that the results do not fit the results for normal subjects. For example, Andrew Comrey has made many analyses of the MMPI, using a mixture of subjects that comprised more than 50 percent patients in a mental hospital. These studies have been included in the survey, since they do contain much information about normal temperamental factors.

Limitation No. 3: The factors of interest to us are those that are found in adult populations or in young people down to the age of about 12 years. Many workers from Thurstone on have noted that factorial patterns differ with age. Particularly, it has been noted that, as compared to adults, children in

the primary grades have less differentiation among factors or fewer factors, partly, no doubt, because such young subjects are unable to respond to the finer shades of meaning in tests or questionnaires. Also, our sponsor, the Office of Naval Research, is naturally concerned with ages 19 and up.

With these limitations considered, we are planning to include in the Kit of reference variables several markers for each factor that has been "established" in the literature. A factor will be regarded as established if what seems subjectively to be the same factor is found in at least three analyses by at least two different laboratories. This criterion for establishment may sound rather lenient, but we do want to include as many factors as possible that may become important in the future. It is precisely those factors that are not yet well established, which are in most need of research by users of the Kit.

We have made no particular point in counting the number of articles in the literature that we have considered, used, or spurned, but a few numbers will help to describe the general scope of the project. A multilithed monograph put out by me at ETS in 1953 rather fully described 68 analyses, all of which yielded factors representing reasonably general traits of human temperment. Just 4 of these used child subjects; 8 used mainly hospital inmates. In the literature since 1953, 77 factor analyses concerned with human temperamental behavior were discarded as being limited to special people or special situations. 20 articles used mainly psychiatric patients; 19 used child subjects. Only about 10 had a methodology or rotational technique that rendered them impossible to compare usefully with the bulk of the articles. Limitation because of methodology was as moderate as this, because the many confusions in factorial results come from variation in the kind of variables included and

in arbitrariness or instability in the rotational process, rather than in the actual statistical models used in guiding either factor extraction or rotation. For example, whether the rotation is orthogonal or oblique seems to make relatively little difference, while the introduction of just one variable can change the picture considerably. This left 110.

Now let's take a look at the "established" factors that this survey has spotted. The Handout lists these factors in alphabetical order, by the symbols we have given them, allowing what is usually considered to be the favorable pole to come first. The items that loaded on each of these factors in many analyses were inspected, and an attempt was made to put these items into several logical categories. These categories of items are named or described in the Handout. They constitute hypothesized marker scales for the factors. Perhaps they can be regarded as hypothesized subfactors, from which the listed first-order factors would appear in a higher order analyses. Diran Dermen, the next speaker, will discuss the results of our tryouts aimed at confirming or refuting these hypotheses.

Let me now pick out a few of the situations that required the more difficult decisions or interpretations that led to the item scales described in the Handout, the ones that we have included in our tryouts. Prior to assembly of the Kit, some of these will, of course, be changed or deleted as a result of new evidence as to the correctness of our hypotheses, which were generated by the literature.

Here is a typical problem where different analyses published in the literature seem to be covering different but overlapping aspects of what might most reasonably be described as a single first-order factor. My example is Factor Se, Sensitive Attitude. As we see it, this is Dr. Cattell's factor called Premsia vs. Harria, Factor I. His Factor I, as seen in the 16 P.F.

Questionnaire represents the item categories labelled C and D in the Handout. Both of these are interests: one in people's welfare and the other in esthetics. This factor in the 16 P.F. does include a few items on emotional sensitivity like those in the Handout's category B, but the 16 P.F. factor does not seem to me to cover category A at all. Comrey and Duffy (1968), on the other hand, have a factor they call "Empathy" that loads short item scales for helpfulness, generosity, sympathy, kindness, interest in people, and service to others. These items seem to include categories A and C, possibly B. Adcock and Adcock (1967) have a factor called "Compassion", which includes fondling fluffy kittens, the pricking of one's conscience, sensitivity to sadness, and avoidance of hurting people's feelings. This also seems to cover categories A, B, and C. I could go on like this: some factors in the literature have categories A and B, some have B and C, and some have only one of the categories listed. No published study that I know of contains all four kinds of variables, and yet, if one did, there is enough evidence available to support the hypothesis that all four categories would load a single first-order factor.

Continuing my discussion of the factor, Sensitive Attitude, I will now talk about the Masculinity-Femininity factor. You can't find this one in the Handout, because we omitted it, despite its having been found many times by many laboratories. We attempted to reflect this factor as seen in the literature by writing four categories of items, as follows: 1. Tough-minded, unemotional vs. sensitive, sympathetic, gets upset. 2. Accepts dirt and nature vs. cleanly, fears creeping animals. 3. Interest in masculine hobbies vs. interest in feminine hobbies. 4. Interest in Masculine careers vs. interest in feminine careers. Well, you can see that this is little more than

a rewording of the categories under Sensitive Attitude. There are two categories concerned with emotional sensitivity and two concerned with interests. No analyses show these two factors side by side with any degree of clarity. Cattell (1950) comes closest to this with factors he called "Emotional sensitive self-sufficiency vs. gregariousness" and "Masculinity-Feminity", but, in that analysis, neither of these factors is clear enough to be convincing. At the other extreme, when Ford and Tyler (1952) analyzed variables from the Terman and Miles Masculinity-Femininity Test, they divided the area into two factors: Emotionality and Interests. Therefore, by including both of these kinds of items in the single factor that we are calling Sensitive Attitude, we are making the assumption that Ford and Tyler overdetermined the first-order domain, and, by so doing, they separated it into subfactors or what we would choose to call markers for one first-order factor that is sometimes called "Sensitivity" and sometimes called "Masculinity-Femininity". A caution to researchers needs to be made here. Since the sexes will differ markedly on either the four categories of items listed under Sensitive Attitude or any four categories that might be correctly listed for Masculinity-Femininity, the variance for these variables and their intercorrelations will be greatly increased for studies using subjects of both sexes, as opposed to subjects of a single sex. Interpretations should be made accordingly. Actually, in the literature both factors Se and M-F have been named with both mixed subject groups and with single-sex subject groups.

In the next sample of a difficult decision that I am going to describe, we are hypothesizing, not the addition of extra concepts to one of Cattell's factors as we did with Sensitive Attitude, but the breaking down of one of Cattell's factors into two factors. I refer to his scale G, which he has

called "Super-Ego Strength" and which is called "Conscientious vs. Expedient" in the 16 P.F. Subjective logical categories for the items in that scale are the three that are listed in the Handout under Morality and also the three that are listed under Persistence. There is, indeed, some logic as to why Morality and Persistence might properly be combined. If one's conscience or super-ego is strong, one is likely to adhere to high morals and also to persist in one's duties or ideals of behavior. There is also rather obvious logic in separating Morality from Persistence.

Here is some of the factorial evidence: In Cattell and Gibbons (1968) a short scale called "persistent effort" was highest loader on a separate factor from one that was dominated by a scale called "lack of moral restraint". Sells et al (1970), on the other hand, seem to confirm Cattell's combining of these areas into one factor, since they separated no morality factor, but did rather clearly show Cattell's G and Guilford's "Cultural Conformity" to fall on a factor they call "Conscientiouseness". Guilford's Cultural Conformity actually combines elements of both "irrational peristence" and "law-abiding morality". In addition to what looks like a valid logical distinction to us, several separate appearances of each factor seem significant. For Morality: Item categories of types B and C were found by Adcock and Adcock (1967) on a factor called "Ego-ideal". Howarth and Browne (1971) had a factor they called "Conscience" that included items in categories B and C and possibly A. Warr, Lee, and Joreskog (1969) called "Virtuous self-denial" a factor that seemed limited to category C. Persistence was found without the concept of morality three times prior to 1953. Also, Barratt's factor (1965) called "Impulsiveness" has items like those listed as B and C under Persistence, plus

the concept of "thinking before I act". Cattell and Gibbons (1968) called their factor that loaded "persistent effort" "Self-sentiment Control, Q_3", a factor regarded by Cattell as distinct from his Factor G. All of this is certainly conflicting, but it did seem safest to make separate marker scales for each factor and find out whether the factors would separate in our tryouts.

Here is another problem: In the case of the factor General Activity, there is some question as to whether plain rapidity of movement (category A) is part of the same factor as being busy and accomplishing things (categories B and C). Guilford's tests, GAMIN and G-Z Temperament Survey, have a scale that contains items from all three categories. On the other hand, Jernigan and Demaree (1971) have two factors: "General Activity", which only includes rapidity of movement, and a separate factor they called "Industriousness". Using lists of adjectives as variables, Sciortino (1969) separated two factors; one he called "Quickness", the other he called "Energy", which included such words as energetic,dynamic, active, and vigorous. In this area particularly, words can be misleading. The word, energy, is very ambiguous, sometimes referring to pure physical activity, sometimes to mental or social activities, and sometimes to either or both. In Cattell's studies the closest factor to this one is Surgency, a combination of enthusiasm, talkativeness, and excitement loving. Sells et al (1970) confirmed that Surgency is separate from General Activity. Our decision was to keep Surgency separate, but to consider rapidity of movement as being on the same factor with energy, in the sense of being busy and accomplishing things. We believe, then, that Jernigan and Demaree and Sciortino overdetermined the area, and so separated the first-order factor General Activity into two subfactors.

Now look at the factor called Restraint vs. Rhathymia. This has three categories of items: A. Planning vs. impulsive, B. Responsible vs. carefree, and C. Enjoys stability vs. wants excitement. All three categories of items appear in scale R of Guilford's Inventory of Factors STDCR and the Guilford-Zimmerman Temperament Survey. Cattell and Gibbons (1968) have a single factor that loads a brief Rhathymia and a brief Carefreeness scale. Adcock and Adcock (1967) have a factor called "Ego control" that has items in categories A and B. Barratt (1965) found category C items on a factor he called "Risk taking". Comrey and Soufi (1961) bring together categories B and C. This all makes Restraint vs. Rhathymia look reasonably solid, but listen to this: Butt (1970) has a factor called "Social concern vs. emotional indifference", item categories B and C, and he has a separate factor called "Impulse control", which seems to contain A cand C. Howarth and Browne (1971) have separate factors they call "Impulsiveness", with very clear category A items, and Rhathymia" with very clear category B items. Even Guilford and Guilford (back in 1939) had a rather interesting hint of this situation. They found a good Rhathymia factor with all three item categories, but they also found a separate weaker factor whose highest loadings were made by the impulsive items, although the magnitude of these loadings was less than those for the same items on the Rhathymia factor. All in all, it seemed wise for us to regard the separate Rhathymia and Impulsiveness factors as instances where overdetermination of the space gave rise to subfactors, and so we are making the hypothesis that the negative of impulsiveness is a part of the first-order factor, Restraint vs. Rhathymia.

After setting up the list of factors that are established in the literature by our definition and after defining each one by actually writing new items in

each of the several categories that might be used as markers for these factors, it became uncomfortably apparent that there was an occasional category of items on one factor that was remarkably similar to one of the categories of items on another factor. It was a kind of fascinating game, then, to inspect side by side every possible pair of item category in the entire list, and to assign to each of these pairs an estimated coefficient of correlation, sometimes negative, usually rather low, but sometimes very high. This generated a hypothetical matrix of intercorrelations among all item categories. If a real matrix turned out to be like this one and was factored, any high correlations between categories of items on disparate factors would prevent the appearance of factors that had been established in the literature. To juggle around the categories very much so as to maximize the success of our hypotheses would be a procedure inconsistent with our central purpose, which was to reflect the findings of many researchers. However, we did scrutinize this hypothetical matrix of intercorrelations in order to make use of it as an additional subjective check on our interpretations of factors in the literature. What we actually did was to eliminate from the list of item categories just a few categories that seem particularly prone to produce factors that would straddle the ones that seemed established by the literature. Following are a couple of examples.

Look at the three categories under Dominance. There used to be a fourth. It was called "Superior, confident socially vs. self-conscious, unsure". This was originally included under Dominance, because it was a part of some of the Dominance factors in the literature. However, it had high estimated correlations with some of the categories under two other factors: Sociability and Poise. Therefore, we simply left out this category under Dominance. Thus, our factor of Dominance, as it stands in the Handout, does not include what might be called social dominance. A check of the literature does not always confirm such decisions as this one. For example, Guilford and Zimmerman (1956) have a Dominance factor, which they call "Ascendance". It is loaded by an item about social leadership, and that same item about social leadership also loads on a separate factor that

they call "Sociability". However, it seemed wise to purge our Dominance factor of sociability variance anyway.

Here is another example of a big estimated correlation between item categories. In the Handout there are three categories under Sociability. However, inspection of sociability factors in the literature originally led us to include a fourth category called "Gregarious, Likes being with people vs. likes solitude, limits friends". It is apparent that a scale of such items would correlate highly with all three of the categories being proposed for the factor Gregariouseness. A reinspection of the literature only partly confirms the idea of omitting gregariousness items from the factor Sociability. Actually, at least four analyses do clearly contain both of these factors side by side, although there are some anlayses that combine the two factors into one. When both factors do occur, the gregariousness items sometimes have loadings on both. Our own studies will have to supplement the evidence on this question. In the meantime it certainly would not make sense for us to hypothesize that a gregariousness marker would stick with Sociability in the same analysis that contains the three markers you see in the Handout for the separate factor of Gregariousness. Therefore, our factor of Sociability must refer to actual social interaction, while Gregariousness refers merely to people being physically in one another's presence. We need research on this. It is a research question, but probably a rather arbitrary one to decide whether Gregariousness is a subfactor or marker for Sociability or whether it is a separate factor in what we must rather arbitrarily decide is the first-order factor domain. I wish I could end at least one speech without yearning for more research, but I can't!

HANDOUT

Factor Ac: General Activity

A. Moves rapidly, quick in physical performances vs. slow
B. Busy, active in projects or (non-social) affairs vs. uninvolved, gets overburdened
C. Accomplishes things rapidly vs. indolent, unmotivated

Factor Ag: Agreeableness

A. Interested in people's welfare, helpful vs. prefers making lone intellectual contributions
B. Cooperative, supportive, forgiving vs. irritated by people, vengeful
C. Adaptable, tends to agree, submissive vs. negativistic, domineering, aggressive
D. Trustful, confides in people vs. suspicious, keeps distance
E. Friendly, likeable, outgoing vs. aloof, unpleasant, withdrawn

Factor Al: Alertness

A. Alertness to immediate surroundings, attentive vs. unaware, engrossed, deep in thought, absent minded

Factor Au: Autistic Tendency

A. Daydreams vs. has practical thoughts
B. Anxiety and worry that leads to autistic thinking vs. relaxed, adjusted, realistic thoughts
C. Bothered by daydreams or autistic distractions vs. enjoys these things

Factor Ca: Calmness vs. Anxiety

A. Relaxed, stable, at ease vs. anxious, worried (about self), edgy, uneasy, nervous, tense, restless (without cause)
B. Takes time to think, deliberate vs. overreacts, impulsive, jittery
C. Confident about the world vs. having fears or worries about outside influences

Factor Co: Concentration

A. Concentration on study or reading, restraint leading to maintenance of attention vs. mind wanders, bored, forgets names

Factor De: Dependability

A. Likes rules, follows plans vs. likes freedom of choice, likes change
B. Dependable, punctual, keeps promises vs. careless about promises and details
C. Self-sentiment control, control of own feelings vs. actions and thoughts are swayed by emotions

Factor Do: Dominance

A. Takes charge socially, wants power vs. submissive, willing to serve
B. Egoistic, pushes own ideas vs. respects others' ideas, self-effacing
C. Rights-conscious, complaining vs. tolerant

Factor E: Emotional Stability

A. Emotionally stable, tolerant, stolid vs. emotionally sensitive, irritable
B. Optimistic, faces problems vs. worrying, dwells on problems, escapist
C. Healthy, feels vigorous, vs. tired, intermittent loss of energy, hypochondriacal
D. Life is good, life is worthwhile vs. feels frustrated, dissatisfied

Factor Em: Emotional Maturity

A. Patient, adjusts to frustration vs. verbally aggressive, demanding
B. Modest, shuns attention, outwardly directed vs. self-centered, seeks attention, egotistical
C. Satisfied, cooperates with authority vs. asserts independence from authority, stubborn

Factor Gs: Gregariousness

A. Likes to be with people physically vs. likes to be alone
B. Interest in occupations with people vs. interest in occupations isolated from people
C. Likes work or socializing with people vs. likes work alone or isolated activities

Factor Me: Meticulousness

A. Meticulous, orderly, neat, careful, particular about personal effects vs. messy, careless, impulsive

Factor Mo: Morality

A. Law-abiding, obedient, well-mannered, patriotic vs. free progressive, liberal
B. Moral, knows right from wrong, resists temptation vs. pleasure seeking
C. Generous, helpful, fair, gives to causes vs. selfish, uncharitable

Factor Na: Need for Achievement

A. Likes to do his best, works hard, persists until successful vs. play before work
B. Likes success in competition, likes getting ahead vs. dislikes competition
C. Strives for accomplishment, wants to produce something great vs. no motivation to do good or to help people

Factor O: Objectivity vs. Paranoid Tendency

A. Objectivity and fairness attributed to others vs. paranoid delusions about others
B. Credit is given by others vs. blame by others is unfair
C. Depends on others for help, advice, and sympathy vs. not interested in others, independent

Factor Om: Open-Minded vs. Authoritarian

A. Believes many different philosophies (religious or political views) can be reasonable vs. rigid belief in one philosophy, no tolerance of compromise
B. Respect for and interest in the religious and political philosophies of other people vs. strong belief in the rightness or wrongness of principles
C. Innovative, readiness for new ideas, flexible, foresighted vs. highly conservative, conventional, and unchangeable in ideas

Factor Pe: Persistence

A. Persistent, persevering, determined vs. quitting, fickle, needs change, gets discouraged
B. Likes stable tasks, interests are stable vs. likes changing tasks, interests change
C. Conscientious, careful, exacting, tidy, orderly vs. relaxed, carefree, nonchalant

Factor Po: Poise vs. Self-Consciousness

A. Enjoys group attention, exhibitionistic, poised vs. dislikes being in front of people
B. Enjoys performing in public, feels pride in speaking to a group vs. dislikes performing in public
C. Seeks comment and attention from important people vs. self-conscious with superiors, avoids criticism

Factor Re: Relaxes vs. Nervous

A. Physically relaxed vs. fidgets, has nervous habits, twitches, has restless movements
B. Tolerant of physical, non-human or situational annoyances vs. irritated by mishaps and frustrating circumstances

Factor Rt: Restraint vs. Rhathymia

A. Planning vs. acting without thought, impulsive
B. Serious, responsible vs. lively, carefree, irresponsible, no thought of the future
C. Enjoys stable pursuits vs. wants excitement, change, wildness

Factor Sc: Self-Confidence

A. Feels confident physically, personally, and career-wise vs. needs encouragement, feels inferior, afraid of failure
B. Claims to have abilities, skills, and good experiences vs. claims handicaps, ineptitude, and unfavorable experiences
C. Perceives others as having been positive toward him vs. negative

Factor Se: Sensitive Attitude

A. Warm, soft, cooperative, kind, considerate vs. hard, stern, bossy
B. Emotionally sensitive, empathic, delicate, quiet vs. robust, noisy, active, tough, fearless
C. Interest in people's welfare, religion vs. interest in people for companionship or fun
D. Interest in imaginative ideas, music, esthetics, literature vs. interest in practical, technical, political, and economic ideas

Factor So: Sociability

A. Competent socially, social organizer, enjoys attention vs. withdrawn, fears public speaking and social responsibilities
B. Glib talker, has superficial social know-how vs. aloof, doesn't know or care what should be said
C. Hardened socially, confident in social contacts vs. shy, socially insecure

Factor Ss: Self-Sufficiency

A. Self-sufficient, likes to be alone in stress, in planning, in facing problems, makes own plans, dislikes being served, self-reliant, decisive vs. dependent, needs help from others, group dependent
B. Desires to be different, individualistic, free vs. needs approval of others, conforms, accepts social order, agrees with group, likes affiliation, complies
C. Unusual ideas, unconventional, idealistic, reflective vs. has majority opinions, tends to have same feelings as others
D. Emotional independence vs. needs love, friends, succorance, and protection

Factor Su: Surgency vs. Repression

A. Exuberant, enthusiastic, cheerful vs. repressed, reserved, inhibited
B. Likes to stimulate and cheer up people vs. quiet stay at home
C. Talks without inhibition, expressive, frank vs. cautious in talking, precise, secretive

Factor T: Thoughtfulness

A. Likes to think, reflect, meditate vs. prevented from doing it by social or business activity
B. Likes to think about people or with people vs. enjoys the company of people without analyzing them
C. Thinks about self vs. carefree about self
D. Intellectual interests vs. active interests

Factor To: Tolerance of Human Nature and Things vs. Criticalness

A. Naive, impunitive, believes people are honest and fair vs. believes people lie and are unfair to gain an advantage
B. Believes people are capable of good work vs. critical, fault finding
C. Tolerant of human nature vs. cynical about human nature
D. Tolerates or respects people vs. feels hostility (convert, not overt) against people or groups of people
E. Tolerates the imperfections in things vs. feels hostility toward things that fail to work

Factor Wb: Well-being vs. Depression

A. Has feeling of well-being, happy vs. depressed, blue, lonely
B. Hopeful, interested in life vs. fear and worry about doom or vague dangers
C. Confident, can stand criticism vs. guilt prone, feels worthless and spurned, worries about himself

A Verification Study of 28 Self-Report Personality Factors

Diran Dermen

Educational Testing Service

John French has summarized the results of his review of the literature. My job is to describe the results of an attempt to verify 28 factors he judged to be established. The 28 factors were broken down into what were judged to be relatively distinct components--from one to five per factor. The components (John has used the term subfactor) numbered 87 in all. Short 12 to 16 item subscales were written to fit each of the 87 descriptions. You will recall that each component was described bipolarly. Equal numbers of positively and negatively keyed items were written to mark each pole. Thus, we started off with balanced subscales; balanced in terms of true-false keying and in terms of the two defined poles.

The more than 1300 items we had written along with the 20 items of the Social Desirability scale from Jackson's Personality Research Form were administered to recruits at the Naval Training Center at San Diego. More than 4000 men were tested in a complex design that divided the battery into 30 overlapping booklets such that no individual was required to respond to more than 320 items, but which also permitted the determination of the relationships among all 87 subscales.

It had been intended to administer the items in the usual fashion but we discovered in the first session that a large proportion of the sample could not finish the booklet in the allotted time. The decision was then made to read all questions aloud. (A new sample took the first battery under the new conditions.) Incidentally, Dr. Goldberg has administered our battery to college students in the normal manner. We will have his data for comparison.

Four hundred cases who had omitted no items were randomly selected and item analyses were performed. Items having contamination-corrected biserials less than .15 or pass-percents less than .10 or greater than .90 were eliminated. In addition, items were eliminated to maintain balance in the number of true- and false-keyed items. Reliabilities (coefficient alphas) were obtained for the refined subscales on a new sample. Ten of the 87 subscales were eliminated in these two steps. The retained subscales ranged in length from 4 to 16 items. Their reliabilities ranged from .35 to .79.

The remaining 77 subscales were intercorrelated and a Minimum Residual Factor Analysis performed. Based on Kaiser's criterion of the number of roots greater than one, 23 factors were retained and rotated to oblique simple structure using the Direct Oblimin program and deltas of 0 to .40. Upon examination of the hyperplane counts and the apparent interpretability of the results, the most oblique solution was retained and will be reported on here. It should be added that the degree of obliqueness is still not high, with the highest intercorrelations among factors being only .36. The amount of variance accounted for by the 23 Minres factors is approximately 78 percent of the total variance. Communalities ranged from .38 to 1.00.

It might be noted that the postulation of 28 factors would have argued for the retention and rotation of 28 factors. However, examination of the correlations among subscales for particular factors argued against the retention of all 28. I will now discuss our results, which, while not being as confirmatory as we would have liked, are interesting.

In the Handout are presented the factor pattern weights and the factor structure correlations for all 23 factors. The descriptions and abbreviations for the subscales are the same as those in John French's Handout (at least they're

supposed to be). In general, only variables with pattern weights greater than or equal to .30 are listed. If a variable had sizable weights on a factor or factors other than the particular factor being presented, the "extraneous" weights are given in brackets after the description of the variable. The last listing for each factor gives the Social Desirability weights and correlations. These were extended into the already determined rotated factor space. It will be noted that the weights are quite low; a function of the fact that Social desirability variance is spread throughout most of the matrix. The Social Desirability correlations, on the other hand, vary from -.37 to .60.

At the top of the first page of the Handout is presented Factor VIII, clearly identifiable as Self-Confidence. All three of the markers designed for this factor appear with sizable weights. They include self-confidence in physical, social, and intellectual areas. The additional markers with small weights also make sense. Note that there is a sizable correlation with the Social Desirability scale.

Factor XII, Gregariousness, appears at the bottom of page 67. The two Gregariousness markers, both of which involve liking to be with people as opposed to liking to be alone, appear on the factor. The B subscale for Gregariousness, an attempt to measure interest in gregarious occupations, failed at the item analysis level and was not included in the factor analysis. The appearance of the B subscale for Objectivity on the factor seems to imply some need of people for moral support and the other two, the A subscale for Persistence, and subscale B for Need for Achievement, may imply the function of the group as a standard of reference.

Open-Mindedness, Factor IX (which appears on page 68) is a very clear factor with all three intended markers appearing. The large loading for

Tolerance and the other loadings imply general openness, trust, and a degree of flexibility. We had originally defined the factor in opposition to authoritarianism but that seems too loaded a description for the negative pole. Although I'm not getting a payoff from Rokeach, I'll settle for closed-mindedness for the negative end of the factor.

Factor Two on page 69 is a fusion of Poise and Sociability. All of the markers for the two appear. They include aspects of enjoyment of attention as well as social competence and social confidence. The negative end of the factor appears to be self-consciousness or shyness; perhaps aloofness.

Factors III and V, which appear on page 70, present an interesting and clear splitting of the four Self-Sufficiency markers into distinct factors. Factor III is clearly a kind of emotional self-sufficiency; an ability to cope with problems alone. Factor V appears to be a more intellectual kind of self-sufficiency, perhaps best characterized by the terms non-conformity or unconventionality. Incidentally, the correlation between the two factors is .20.

On page 71 we are again presented with a splitting of a single expected factor into two fairly distinct and at least moderately clear factors. Factor VI is reasonably interpretable as a kind of thinking about the outside world, the usual kind of "liking thinking." I have taken the liberty of coining the phrase "extraspective" to describe this factor. I trust there is at least one among you who will forgive me. Factor XXII with a very large weight for "Thinks about self" and liking to "think, reflect, meditate" appears introspective in nature. The two factors correlate only .18.

Factor I, appearing on page 72 is the largest among the rotated factors. It is described as calm, relaxed vs worried, nervous. It might also

be characterized as anxiety. Two markers for each of the Calmness, Autistic Tendency, Dependability, and Well-Being factors appear. If fewer factors had been extracted one would be tempted to characterize it as indistinct from the commonly found second-order anxiety factor. Its direct contribution to the variance of the factor ensemble is only about 8%. Perhaps more refined subscales or a more oblique solution would permit separation of the components marking this factor. It is rather highly correlated with Social Desirability.

Factor IV on page 73 is, as you see, labeled Restraint in recognition of the appearance of the two markers for that factor. It might just as easily be characterized as planful and serious vs. carefree.

Factor XVII, labeled Persistence-Meticulousness should have been labeled simply Meticulousness. Subscale C for Persistence is clearly more meticulous than persistent. Subscale B for Persistence, "Likes stable tasks, interests are stable" defines a specific factor uncorrelated with this one. The small loading for autistic thinking lends a slight flavor of compulsiveness.

On the next page, Factor XVI, Moral vs. Hedonistic, is characterized by pleasure-seeking both in activity and in fantasy. It seems to be clearly defined. Its hedonistic aspect appears more clearly than does its morality aspect.

The "Adjusted to Society" Factor seems quite clear. I was tempted to label it "Jack Armstrong." The array of Morality, Objectivity, Emotional Maturity, and Tolerance do nothing to dissuade me from this interpretation. Its relatively low correlation with social desirability may say something about what <u>is</u> socially desirable in today's society.

Factors VII and XIII on page 75 are not particularly clear. Both have markers for Dominance, but note the opposite-signed weights for the B subscale for Relaxed vs. Nervous, "Tolerant of physical, non-human, or situational annoyances." Of the two factors, the first seems less fuzzy.

On page 76 of the Handout, Factor X, there is an omitted variable. Subscale C of the Restraint markers "Enjoys stable pursuits vs. Wants excitement, change, wildness" should have a weight of .33 and a correlation of .46. Unfortunately, it messes up the "Optimistic about People" interpretation of the factor, unless perhaps the negative side of the subscale implies a need to escape from people or the world. (See, if you work hard enough, anything fits.) With the possible exception of the Restraint variable, the factor description does seem appropriate. The factor is correlated .36 with Factor I, Calm, Relaxed vs. Worried, Nervous.

Factor XXIII is characterized by moderate loadings for Calmness, Sensitive Attitude, and Tolerance subscales. "Gentleness" is not an entirely satisfactory description but it's close.

Factor XVIII on page 77 has only one large weight but all of the small weights fit the "Energetic, Vigorous" interpretation. This factor could be validated on Hubert Humphrey.

Factor XIX appears to be a fairly specific factor characterized by helpful concern for other people's welfare.

The remaining four factors, XI, XIV, XV, and XX, seem to me to be specifics and most simply interpretable in terms of the subfactor description associated with each. I won't take time to discuss them.

So, where are we? It seems to me that the present study verifies a number of John French's conclusions on the existence and the nature of the

factors: Self-Confidence, Gregariousness and Open-Mindedness are completely clear. We were not at all surprised by the fusion of Poise and Sociability. The splits of Self-Sufficiency and Thoughtfulness both seem sensible. Our so-called anxiety factor worries me a bit. Could we have split it into components more in line with what we expected?

Meticulousness seems now to be clearly established, but where has Persistence gone? Perhaps it will prove to be as elusive as are replicable, construct-validated measures of rigidity. Perhaps persistence occurs in the service of other more salient traits.

I am uncomfortable with the factor labeled Restraint. Its markers seem too discrepant. The only one of the remaining factors that seems at least close to what we expected is our "Energetic, Vigorous" factor which has two markers for General Activity and other markers consonant with an "energetic" interpretation.

Why not more success? We probably could have done Procrustes rotation and had more positive results. Perhaps our factors are not oblique enough. (We will try to get a more oblique solution.) Perhaps we are lousy item writers. Perhaps the ten discarded subscales were critical. Does oral administration of the items account for anything? Whatever limitations the study does have, I've found the results to be surprisingly interpretable.

One last point. While pride might dictate otherwise, we will keep in mind that this is but one study. While some revision of the conclusions of the literature review will be appropriate, factors will not be rejected nor described as "established" solely on the basis of the present study.

Thank you.

HANDOUT

Factor VIII

Self-Confidence

	Wt.	Corr.	
Sc(A)	.66	(.81)	Feels confident physically, personally, and career-wise vs. Needs encouragement, feels inferior, afraid of failure.
Sc(B)	.77	(.82)	Claims to have abilities, skills, and good experiences vs. Claims handicaps, ineptitude, and unfavorable experiences.
Sc(C)	.56	(.69)	Perceives others as having been positive toward him vs. Negative.
O (B)	.32	(.51)	Credit is given by others vs. Blame by others is unfair.
E (D)	.30	(.51)	Life is good, life is worthwhile vs. Feels frustrated, dissatisfied.
SD	.24	(.51)	Social Desirability

Factor XII

Gregariousness

Gs(A)	.47	(.59)	Likes to be with people physically vs. Likes to be alone.
Gs(C)	.77	(.81)	Likes work or socializing with people vs. Likes work alone or isolated activities.
O (C)	.40	(.56)	Depends on others for help, advice, and sympathy vs. Not interested in others, independent.
Pe(A)	.34	(.42)	Persistent, persevering, determined vs. Quitting, fickle, needs change, gets discouraged. [XVII .30]
Na(B)	.32	(.48)	Likes success in competition, likes getting ahead vs. Dislikes competition. [XXI .30]
SD	.03	(.31)	Social Desirability

Factor IX

Open-Minded

	Wt.	Corr.	
Om(a)	.87	(.86)	Believes many different philosophies (religious or political views) can be reasonable vs. Rigid belief in one philosophy, no tolerance of compromise.
Om(B)	.79	(.80)	Respect for and interest in the religious and political philosophies of other people vs. Strong belief in the rightness or wrongness of principles.
Om(C)	.48	(.59)	Innovative, readiness for new ideas, flexible, foresighted vs. Highly conservative, conventional, and unchangeable in ideas.
To(C)	.56	(.83)	Tolerant of human nature vs. Cynical about human nature.
Em(C)	.47	(.61)	Satisfied, cooperates with authority vs. Asserts independence from authority, stubborn. [XXI .30]
Ag(D)	.42	(.52)	Trustful, confides in people vs. Suspicious, keeps distance. [X.30]
Se(A)	.41	(.54)	Warm, soft, cooperative, kind considerate vs. Hard, stern, bossy. [XXIII .42]
SD	.22	(.52)	Social Desirability

Factor II

Poise, Sociability vs. Self-Consciousness

	Wt.	Corr.	
Po(A)	.82	(.86)	Enjoys group attention, exhibitionistic, poised vs. Dislikes being in front of people.
Po(B)	.79	(.82)	Enjoys performing in public, feels pride in speaking to a group vs. Dislikes performing in public.
Po(C)	.39	(.51)	Seeks comment and attention from important people vs. Self-conscious with superiors, avoids criticism.
So(A)	.60	(.75)	Competent socially, social organizer, enjoys attention vs. Withdrawn, fears public speaking and social responsibilities.
So(B)	.55	(.69)	Glib talker, has superficial social know-how vs. Aloof, doesn't know or care what should be said. [XVIII .36]
So(C)	.76	(.80)	Hardened socially, confident in social contacts vs. Shy, socially insecure.
Do(A)	.31	(.56)	Takes charge socially, wants power vs. Submissive, willing to serve.
SD	.04	(.30)	Social desirability

Factor III

Self-Sufficiency--Emotional

	Wt.	Corr.	
Ss(A)	.98	(.91)	Self-sufficient, likes to be alone in stress, in planning, in facing problems, makes own plans, dislikes being served, self-reliant, decisive vs. Dependent, needs help from others, group dependent.
Ss(B)	.03	(.25)	Desires to be different, individualistic, free vs. Needs approval of others, conforms, accepts social order, agrees with group, likes affiliation, complies.
Ss(C)	.03	(.15)	Unusual ideas, unconventional, idealistic, reflective vs. Has majority opinions, tends to have same feelings as others.
Ss(D)	.62	(.64)	Emotional independence vs. Needs love, friends, succorance, and protection.
To(E)	.38	(.41)	Tolerates the imperfections in things vs. Feels hostility toward things that fail to work[XXIII.41]
Na(A)	.35	(.43)	Likes to do his best, works hard, persists until successful vs. Play before work.
SD	.07	(.22)	Social Desirability

Factor V

Self-Sufficiency--Nonconformity

Ss(A)	-.03	(.28)	Self-sufficient, likes to be alone in stress, in planning, in facing problems, makes own plans, dislikes being served, self-reliant, decisive vs. Dependent, needs help from others, group dependent.
Ss(B)	1.03	(.[illegible])	Desires to be different, individualistic, free vs. Needs approval of others, conforms, accepts social order, agrees with group, likes affiliation, complies.
Ss(C)	.39	(.44)	Unusual ideas, unconventional, idealistic, reflective vs. Has majority opinions, tends to have same feelings as others.
Ss(D)	.17	(.28)	Emotional independence vs. Needs love, friends, succorance, and protection.
Na(C)	-.43	(-.48)	Strives for accomplishment, wants to produce something great vs. No motivation to do good or to help people.
SD	-.05	(-.22)	Social Desirability

Factor VI

Thoughtfulness--Extraspective

	Wt.	Corr.	
T(A)	.17	(.41)	Likes to think, reflect, meditate vs. Prevented from doing it by social or business activity.
T(B)	.33	(.53)	Likes to think about people or with people vs. Enjoys the company of people without analyzing them.
T(C)	-.04	(.16)	Thinks about self vs. Carefree about self.
T(D)	1.10	(.95)	Intellectual interests vs. Active interests.
SD	.01	(.32)	Social Desirability

Factor XXII

Thoughtfulness--Introspective

T(A)	.44	(.48)	Likes to think, reflect, meditate vs. Prevented from doing it by social or business activity.
T(B)	.18	(.31)	Likes to think about people or with people vs. Enjoys the company of people without analyzing them.
T(C)	1.01	(.95)	Thinks about self vs. Carefree about self.
T(D)	-.06	(.10)	Intellectual interests vs. Active interests.
SD	.09	(.08)	Social Desirability

Factor I

Calm, Relaxed vs. Worried, Nervous

	Wt.	Corr.	
Re(A)	.88	(.84)	Physically relaxed vs. Fidgets, has nervous habits, twitches, has restless movements.
Ca(A)	.82	(.84)	Relaxed, stable, at ease vs. Anxious, worried (about self), edgy, uneasy, nervous, tense, restless (without cause).
Ca(B)	.34	(.64)	Takes time to think, deliberate vs. Overreacts, impulsive, jittery [XXIII .51]
Au(a)	-.31	(-.52)	Daydreams vs. Has practical thoughts [XVI -.38]
Au(B)	-.62	(-.84)	Anxiety and worry that leads to autistic thinking vs. Relaxed, adjusted, realistic thoughts [XVII .32]
E(A)	.59	(.76)	Emotionally stable, tolerant, stolid vs. Emotionally sensitive, irritable [XIV -.34]
De(B)	.33	(.54)	Dependable, punctual, keeps promises vs. Careless about promises and details. [IV .47]
De(C)	.41	(.62)	Self-sentiment control, control of own feelings vs. Actions and thoughts are swayed by emotions.
Co(A)	.38	(.60)	Concentration on study or reading, restraint leading to maintenance of attention vs. Mind wanders, bored, forgets names.
Wb(A)	.32	(.65)	Has feeling of well-being, happy, vs. Depressed, blue, lonely.
Wb(C)	.34	(.64)	Confident, can stand criticism vs. Guilt prone, feels worthless and spurned, worries about himself.
SD	.23	(.60)	Social Desirability

Factor IV

Restraint vs. Rhathymia?

	Wt.	Corr.	
Rt(A)	.34	(.52)	Planning vs. Acting without thought, impulsive.
Rt(B)	.65	(.70)	Serious, responsible vs. Lively, carefree, irresponsible, no thought of the future.
Rt(C)	.00	(.28)	Enjoys stable pursuits vs. Wants excitement, change, wildness. [X .33; XVI .36]
De(B)	.47	(.62)	Dependable, punctual, keeps promises vs. Careless about promises and details. [I .33]
Ag(A)	.36	(.48)	Interested in people's welfare, helpful vs. Prefers making lone intellectual contributions. [XIX .41]
SD	.03	(.27)	Social Desirability

Factor XVII

Persistence--Meticulousness

Pe(a)	.30	(.48)	Persistent, persevering, determined vs. Quitting, fickle, needs change, gets discouraged.
Pe(B)	.06	(.03)	Likes stable tasks, interests are stable vs. Likes changing tasks, interests change. [XX 1.09]
Pe(C)	.59	(.69)	Conscientious, careful, exacting, tidy, orderly vs. Relaxed, carefree, nonchalant.
Me(A)	.52	(.62)	Meticulous, orderly, neat, careful, particular about personal effects vs. Messy, careless, impulsive.
Au(B)	.32	(.06)	Anxiety and worry that leads to autistic thinking vs. Relaxed, adjusted, realistic thoughts [I -.62]
SD	.07	(.33)	Social Desirability

Factor XVI

Moral vs. Hedonistic

	Wt.	Corr.	
Mo(B)	.98	(.93)	Moral, knows right from wrong, resists temptation vs. Pleasure seeking.
Au(A)	-.38	(-.48)	Daydreams vs. Has practical thoughts [I -.31]
Rt(C)	.36	(.56)	Enjoys stable pursuits vs. Wants excitement, change, wildness [X .33]
SD	.08	(.31)	Social Desirability

Factor XXI

Adjusted to Society

Mo(A)	.68	(.75)	Law-abiding, obedient, well-mannered, patriotic vs. Free progressive, liberal.
O (A)	.40	(.55)	Objectivity and fairness attributed to others vs. Paranoid delusions about others [VII -.38]
Em(C)	.30	(.50)	Satisfied, cooperates with authority vs. Asserts independence from authority, stubborn. [IX .47]
Na(B)	.30	(.40)	Likes success in competition, likes getting ahead vs. Dislikes competition. [XII .32]
To(B)	.30	(.40)	Believes people are capable of good work vs. Critical, fault finding.
SD	.07	(.36)	Social Desirability

Factor VII

Intolerant of Situations?

	Wt.	Corr.	
Do(A)	.10	(.13)	Takes charge socially, wants power, vs. Submissive, willing to serve.
Do(B)	.21	(.23)	Egoistic, pushes own ideas vs. Respects others' ideas, self-effacing.
Do(C)	1.02	(.96)	Rights-conscious, complaining vs. Tolerant.
Re(B)	-.42	(-.53)	Tolerant of physical, non-human or situational annoyances vs. Irritated by mishaps and frustrating circumstances.
O (A)	-.38	(-.53)	Objectivity and fairness attributed to others vs. Paranoid delusions about others. [XXI .40]
SD	.11	(.31)	Social Desirability

Factor XIII

Dominance?

Do(A)	.23	(.32)	Takes charge socially, wants power vs. Submissive, willing to serve.
Do(B)	.75	(.78)	Egoistic, pushes own ideas vs. Respects others' ideas, self-effacing.
Do(C)	.10	(.15)	Rights-conscious, complaining vs. Tolerant.
Re(B)	.33	(.35)	Tolerant of physical, non-human or situational annoyances vs. Irritated by mishaps and frustrating circumstances.
SD	.04	(.09)	Social Desirability

Factor X

Optimistic about people?

	Wt.	Corr.	
To(A)	.90	(.82)	Naive, impunitive, believes people are honest and fair vs. Believes people lie and are unfair to gain an advantage.
Ca(C)	.50	(.60)	Confident about the world vs. Having fears or worries about outside influences.
Ag(D)	.30	(.45)	Trustful, confides in people vs. Suspicious, keeps distance [IX .42]
SD	.12	(.46)	Social Desirability

Factor XXIII

Gentleness

Ca(B)	.51	(.64)	Takes time to think, deliberate vs. Overreacts impulsive, jittery. [I .34]
Se(A)	.42	(.52)	Warm, soft, cooperative, kind, considerate vs. Hard, stern bossy. [IX .41]
To(E)	.41	(.56)	Tolerates the imperfections in things vs. Feels hostility toward things that fail to work. [III .38]
SD	.07	(.36)	Social Desirability

Factor XVIII

Energetic, Vigorous

	Wt.	Corr.	
E (C)	.60	(.72)	Healthy, feels vigorous, vs. Tired, intermittent loss of energy, hypochondriacal.
So(B)	.36	(.44)	Glib talker, has superficial social know-how vs. Aloof, doesn't know or care what should be said.[II .55]
Ac(A)	.32	(.39)	Moves rapidly, quick in physical performances vs. Slow.
Ac(C)	.33	(.52)	Accomplishes things rapidly vs. Indolent, unmotivated. [XV .30; XXI .32]
SD	.09	(.34)	Social Desirability

Factor XIX

Generous, Helpful

Mo(C)	.68	(.70)	Generous, helpful, fair gives to causes vs. Selfish, uncharitable.
Ag(A)	.41	(.48)	Interested in people's welfare, helpful vs. Prefers making lone intellectual contributions. [IV .36]
SD	-.03	(.05)	Social Desiribility

Factor XI

Specific

Em(B)	.90	(.90)	Modest, shuns attention, outwardly directed vs. Self-centered, seeks attention, egotistical.
SD	.06	(.16)	Social Desirability

Factor XIV

Specific

	Wt.	Corr.	
Su(A)	.74	(.86)	Exuberant, enthusiastic, cheerful vs. Repressed, reserved, inhibited.
E (A)	-.34	(-.15)	Emotionally stable, tolerant, stolid vs. Emotionally sensitive, irritable.[I .59]
SD	.14	(.35)	Social Desirability

Factor XV

Specific

Su(B)	.94	(.94)	Likes to stimulate and cheer up people vs. Quiet stay at home.
Ac(C)	.30	(.42)	Accomplishes things rapidly vs. Indolent, unmotivated. [XVIII .33; XXI .32]
SD	.03	(.25)	Social Desirability

Factor XX

Specific

Pe(B)	1.09	(.93)	Likes stable tasks, interests are stable vs. Likes changing tasks, interests change.
SD	-.09	(-.37)	Social Desirability

Factor Reference Kits and Personality Structure Theory

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I think my title sufficiently indicates the main premise of my position, namely, that no one in his psychological senses would undertake the labor of constructing a reference scale unless he had first ascertained the natural personality structure to which it refers and from which it draws its validity evaluation. This position makes test construction something more than psychometrics; in fact it becomes an integral part of research on personality theory. Psychologists nevertheless fall into two groups according to the pole of this relationship at which they stand. To the psychometrist the test or means of measurement is the thing and the personality trait structure is just the means of conceptually validating his test. To the personality theorist, on the other hand, the hypotheses of trait structure are primary and the test is merely one of several operational bases for his theory. My affiliations are with the second group, and when I develop a scale for anxiety, surgency, premsia or ego strength in the 16 P.F. or HSPQ this scale is a hostage which I hand over to other psychologists as an earnest of the truth of my trait theory and an operational base whereby they can test it.

This difference of emphasis has, of course, many associated differences. For example, the theorist will want evidence that his structures exist in the other two media of observation beyond Q-data, namely in L- and T-data; that is in ratings and in objective, laboratory tests, and he will want evidence of unitary structure in trait growth, such as is now coming in through differential-R factor analysis. In regard to the former we are passing through a period of

skepticism, but I am about to publish some extensive results showing that if sound ratings and questionnaire measures are factored together the same structures indubitably appear provided the intruding instrument factors are clearly set aside. Incidentally, since in this brief presentation there are at least four points at which I shall invoke massive data which cannot be presented here, it is fortunate that I can refer you to a single summarizing source. This is my book, Personality and Mood by Questionnaire, appearing this fall from Jossey-Bass at San Francisco, with nearly a hundred summarizing tables and calculations.

I have just suggested that the proper beginning in psychometrics is the marriage of the right test scale with the right factorially unitary trait structure; but as in marriage generally a good beginning isn't everything. Very few people in the test construction game seem to have realized that it takes many years to groom a scale to maximum compatibility with a given personality factor. In the last two or three years various publications have appeared claiming to establish a factor scale on one or at most two factor analyses. Even if these factor analyses were technically good, which I can show they have not been, this cannot be done. The reasons are first that single items change their meaning to a significant degree with changes of population and secondly that estimates of one and the same factor score, used as the criterion in item analysis, correlates relatively poorly, according to the items used in estimation. It has taken just twenty-five years, since the first definition of the 16 P.F. primary structure by Dave Saunders and myself, to the production of the present day 16 P.F. with four equivalent scales for each factor. In that time some fourteen factor analyses of the domain have

been made using what I have defined in my book as the principle of progressive rectification, alternating item and scale factor analyses and shifting across different types of population. Incidentally, though the ideal of finding items that have transferability across populations is necessary for an all-purpose test, it has never been fully achieved. For example, our recent comparison of 16 P.F. item validities on a mature adult population and an undergraduate population shows that on the superego factor G and the radicalism factor Q_1 this twenty-five year search for good markers has still left us with items good on one group and not on another. The factor persists but the items change with time and population.

In this somewhat unstable world the married scale and factor perform a mutual service of progressive rectification, in years of programmatic research. Having said this I am now going to dwell somewhat more intensively on the personality structure side, taking it for granted that if the structure is well defined the busy psychometrist will sooner or later produce good scales. If I am asked what I consider this structure to be I can answer best by a brief reference to history into the psychologists involved. The first factored questionnaire scales came out in the late forties by Guilford, Thurstone and myself. Since Thurstone re-rotated in Guilford's space I can speak essentially of the G-Z and the 16 P.F., indicating the number of primaries in the stratified personality sample of items to be in the region of 12 to 18. The number in the observer rating domain was fewer, about 12, but in more recent work I have shown that with thorough ratings it climbs close to the same number as for Q-data. In pursuing Q-data analyses over different age ranges and population my coworkers became aware of factors only intermittently visible and hence not included in the 16 P.F. which we came to call the seven

missing factors. A concentrated search for them in the last ten years by Delhees, Marshall and DeVoogd, however, has confirmed these seven and produced two equivalent scales for each.

We are thus today talking about 23 primary factors among which some 9 or 10 second orders, such as anxiety, exvia, cortertia, etc., have been replicated several times. But this is only in the domain of normal items and if we throw in the substance of various pathological behaviors, including the MMPI we find 12 abnormal primaries beyond the 23 of the extended 16 P.F. The Clinical Analysis Questionnaire, for which Dr. Sells and I are now constructing an equivalent B form, thus has no fewer than 28 primary factors and 12 second orders.

But while this programmatic, interlocking research by many collaborating investigators, using common markers and sophisticated factor analytic methods has been going on, other quite dissident views about personality structure have appeared. Eysenck has widely publicized scales claiming to cover personality with only 3 factors; Comrey has about 8, Norman in the rating field stops at 5, Howarth's scale has 10, and so on. Not only do they wander all over the place as to the number of factors, despite a roughly common item foundation, but their rotations result in differing patterns for which no congruence coefficients show any substantial agreement.

Vaughan has an article unfortunately still in press inspecting the technical procedures of these researches and I have been moved to do the same in a spot-check reported in my forthcoming book. In this latter I have set out for the reaction of the factor analytic world, eight conditions which seem vital for a factor analysis the results of which one would take seriously.

They include, besides good sampling of people and variables, a test for the number of factors, a use of estimated communalities instead of unities, an objective blind rotation to maximum oblique simple structure, a test of statistical significance of the simple structure reached and a check on invariance across researches by the congruence or salient variable similarity coefficients among the factor patterns. It turns out that fifths of the researches published between 1968 and 1973 and quoted as unsettling the conclusions I have just given fail on two or more of these requirements. Even failure on one, such as number of factors, suffices to ruin the conclusions. This question of technical care is vital because in hardly any other place in psychology do we go through so many processes between the data and the final conclusions as in uniquely rotated factor analytic solutions.

Since an error at the first decision point--that for number of factors--accounts already for the majority of the studies deviating from our programmatic conclusions. I obviously give an account of why my laboratory has rested on the scree test for the number of factors. Though I have offered a theoretical basis for it in my 1966 article, and Tucker has valuable statistical arguments for his closely similar procedure I am prepared to take my stand for it entirely on empirical grounds. Over a dozen plasmodes--that is, correlation and score matrices built from a known number of factors--have yielded the correct number of factors when examined by the scree, without a single failure. And in two instances where we went to the expense of running the full maximum likelihood analysis, on which I think we can all agree, the result of the scree and the likelihood method concurred.

By these tests the number of factors in the 184 to 500 items defining the personality sphere in the 16 P.F. is around 20 (or 23 if the missing factor markers are included) the largest and most stable 16 of which are scored as 16 P.F. scales. If this is correct, Howarth's 10 from the same data is a bad underfactoring; those settling on 5 to 8 are statistically deluded, and Eysenck's holy trinity can have only religious rather than statistical significance. However, I think we can throw some light on what the resultant scales are. By rotating underfactored plasmodes DeYoung and Finkbeiner, independently have shown that the factors thus reached, incidentally rather deficient in simple structure, are rough approaches to second order factors. (that is to say to second orders projected on items, or "grounded" as we say). But the emphasis is on rough, especially if the underfactoring is severe, and Barton's recent work shows that the Eysenck and Comrey scales have lower and contaminated factor validity compared to those in the CTS Kit deliverately item analyzed against second orders located from the full roster of primaries.

As every factor analyst knows, although one cannot rotate to good results on the wrong number of factors, it is still possible to go grievously astray in rotation even when one has passed the first hurdle and began with the right number. My coworkers and I have written so many articles on the problems, canons and programs of rotation that I can add nothing here except a word of warning against a current epidemic. I refer to the epidemic of factor resolutions by lazy push button use of alleged simple structure discovering analytical programs. The rationalization is that these must be more objective and correct than anything humanly guided. It is as if someone

demonstrated the superiority of the machine by pushing the self starter and jumping out as his car started moving. Analytical automatic programs, but not topological automatic (of which the only representative is maxplane) have never been given the right mathematical functions and so reliably deliver the wrong answer. Finkbeiner and I have recently shown that in most well planned factor analytic studies the count that should be maximized is that of variables in the $\pm$.05 band, not $\pm$.10 or $\pm$.15. Analytical programs, but not maxplane or rotoplot indiscriminately capitalize on gains in low loadings and high loadings, regardless of the required hyperplane width. In five years I have not encountered an analytical solution the $\pm$.05 hyperplane of which I could not improve by blind rotoplot hand rotations, with unmistakable change in the resultant meaning and sometimes matching of the factor.

For someone who set out by saying that his main concern was to guide scale construction by personality theory I may seem to have spent a lot of time on factor analytic technicalities. But until we conduct something like an anti-pollution crusade, calling for serious application of the widely agreed but not widely practiced canons of factor analysis, the part of theory that comes from this foundation is going to be contaminated and misleading. I say part of theory for, as I said initially, the verification and extension of structural concepts from factor analysis rests on many other techniques. For example, we now have evidence from well stratified samples, independently in America and Britain, of the age trends on 16 P.F. primaries and secondaries from about 10 to 70 years of age. On these curves one observes that of the four primaries which enter the exvia secondary, surgency declines steeply from 20 to 40, affectia and parmia rise and self-sufficiency stays level. It

is on such a basis, and the superior multiple correlations with various life criteria, for example, achievement creativity records, that I would argue, in contrast to Eysenck and Comrey, that the primary personality structures have greater psychological unitariness and functional reality than the secondaries. Personality theory, as distinct from psychometrics, could thus come to the conclusion that the secondaries are only patterns arising in primaries through relatively incidental social status or other influences bringing some joint selection on primaries.

To take another quick and concluding illustration from the many ways in which the impact of personality theory on scale construction could be studied, I would mention that the psychological conception of a broad temperament trait like affectia or a broad dynamic organization trait like ego strength calls for a lower degree of item homogeneity in good scale construction than straight psychometrists are usually willing to take. The truth about trait structure lies midway between those psychometrists who obsessively seek highly homogeneous scales, and those experimentlists, e.g., some Skinnerians, who think all is specificity of conditioning. A primary source trait should have its items widely sampled from life areas, foregoing the false goal of homogeneity which can be easily attained by introducing semantic instrument factors; that is, by asking the same questions in ten different synonyms. By wide behavior sampling the mean inter-item correlation in a typical 16 P.F. scale has been kept down to 0.1 or less, with a mean item-factor validity of 0.3. Yet with only 13 items the weighted scale score gives a validity of about 0.8 against the factor. It is in matters like this that personality theory and classical itemetric theory set different standards.

And I would add that the need for enriching the itemetric approach to psychometrics by superordinate directives from personality theory becomes even more imperative when we extend from temperament to dynamic traits and from traits to psychological states.

Finally in this interdependence of scales personality constructs I come to the question of naming the now quite enriched concepts embodied in each personality factor. From the beginning of my factoring of personality dimensions --and this goes back to two articles published in 1933--I have encouraged psychologists to use a non-committal but agreed symbol for each factor as it becomes sufficiently replicated. Thus arose the A, B, C, D, etc., notation for questionnaire factors and the universal index, U.I., numbers which researchers in several countries now use for the objective test factors. The object of the non-committal symbol is to distinguish the undoubted pattern from the questionable and possibly temporary interpretation which a verbal label would imply. This has worked well but we are now coming to a ripeness of theory, as I trust I have shown in my book, Personality and Mood by Questionnaire, where if we are to escape the confusing associations and vaguenesses of popular terms we must, like chemists or physicists, use our own technical terms. That is why I have called factor A, affectia; B, intelligence; C, ego strength, G, super ego strength; M, autism, and so on. In short, if theory and scale construction are to be brought together it is time for psychometrists to begin taking theory seriously. The decision to hypothesize that, for example, C is ego strength, is based on its being the factor which is significantly low in all forms of psychopathology; on its normally rising steadily with age; on its loading substantially the second order factor of anxiety; on its being high in occupations, such as commercial airline pilots, requiring emotional control and

steadiness; and on its rising significantly with successful therapy. A similar process of scientific inference has gone into the tenative naming of other factors, and I think that after watching 20 to 30 years of carefully set out theoretical development anyone with a feeling for the history and tenets of science realizes that the time has come for respecting these more theoretically meaningful titles. Vague popular terms for these factors like sociable, emotional or friendly will get us nowhere except into a Tower of Babel. I am not suggesting that terms from programmatic personality research be considered sacrosanct and permanent. But while the index numbers hold the pattern identity at a descriptive level, the carefully chosen labels given by those long programmatically researching on personality structure express a precise theory. If the theory proves wrong they should be re-named, as alpha particles were renamed when the nature of protons and neutrons became clear. But it is an inevitable part of the progress we are making in relating reference scales to personality theory that those scales should receive scientifically meaningful technical rather than merely popular names, and that these names should provoke theoretical discussion and sometimes a need for amendment. These points and the index system which at least forty investigators here and abroad have used since I made in my 1957 book on Personality and Motivation Structure and Measurement and have continued more responsively to findings on primary and secondary trait and state patterns since in my present book on Personality and Mood by Questionnaire.

The call by Dr. Goldberg for a thorough definition of the personality sphere and that by Dr. Harman, Dr. Dermen, and Dr. Fiske in terms of instrument factor design, for expert and well planned use of factor analysis, as well as the life long work of Dr. French and Dr. Royce in organizing findings and

pointing to gaps in the system have made possible today the transition I have just been discussing from a rank growth of arbitrary questionnaires to a scientifically recognizable set of reference scales, functionally related to personality structure theory. After a long and exacting period of carefully interlocking, programmatic research we are at last close to a universally accepted set of measures on which developmental and other personality research can firmly move forward. I would suggest in closing as I did in opening that this firm ground will be achieved only by greater regard for basic factor analytic technical standards on the one hand, and, by interest in theoretical interpretations from the wider field of personality research on the other.

Summaries of Discussants

Joseph R. Royce
The University of Alberta

Factor Invariance

The major issue at the heart of this symposium is the problem of factor invariance. It happens to be the big issue in substantive factor research--and, unless the factor methodologists resolve it, the factor approach may not fully achieve its enormous potential.

French's analysis shows, by concrete examples, the practical difficulties involved in factor invariance. The essence of the problem is: "Are we talking about the same factor?"

More abstractly, this issue can be summarized via the following 4-fold table:

		Subjects: Same	Subjects: Diff.
Variables	Same	I	II
	Diff.	III	IV

Of course when the subjects are the same and the variables are the same no issue arises regarding factorial invariance. The degree and scope of the invariance issue can be viewed as follows:

Case I — Reliability

Case II, Case III — Resolvable Sampling Problems

Case IV — Apparently Impossible

Quantitative resolution of Case IV is apparently impossible to solve due to insufficient information. However, Case IV is the most typical case. The only hope at present is via long-range programmatic empirical research, in accordance with Cattell's guidelines, and as exemplified by Dermen's study. This procedure involves empirical checks on hypothesized factors which are identified a priori by "marker variables".

Questions for the Symposium Participants

Drs. Cattell and Harman: Suppose we allow for the semi utopia via Cattell's eight criteria, and, further, let us grant that this would increase the probability of identifying invariant factors. My question is, Wouldn't we still have a difficult time of it, and wouldn't a quantitative solution for Case IV still be impossible? (i.e., the case where we are wondering whether we're talking about the same factor in spite of differences in the sampling of subjects and measurements). Could you also comment on whether it would be scientifically valid and/or desirable to set up an International Bureau of Measurements (e.g., via the International Union of Scientific Psychology) which would constitute a Scientific World Court to rule on Universal Index factor constructs. It is my opinion that a procedure such as this is needed, and that it is, in fact, in accordance with precedence in other scientific disciplines.

Drs. French and Dermen: Why did you compose completely new items for each hypothesized factor? Why did you not at least retain the old items as "markers"? Also, would French be good enough to elaborate on the oblique-orthogonal rotation point on page 5 of his manuscript. This surprises me.

With regard to language and personality traits, I have two questions, the first is for anybody on the panel, while the second question is for Dr. Goldberg (and possibly Dr. Cattell). If we begin with the premise that

the relationships between language and behavior are somewhat tenuous--then:

(1) How is it that we get replicable factors at all via the generally weak data base of self-report personality questionnaires?

(2) It is my understanding that the Cattell-Odbert study of 30 years ago was conducted as a pilot study which was replaced by more behavior oriented investigations. Since there is considerable extrapolation required between "linguistic preferences" and "traits inferred from behavior," Why are you so optimistic about language as the route to personality traits?

Donald W. Fiske

University of Chicago

The work of Goldberg, Norman, and Peabody on a descriptive taxonomy should prove valuable. It will show us how human beings perceive and construe each other in the everyday world. It will bring out our implicit personality theory, the personality taxonomy of the English-speaking world, and also of those speaking other languages. Perhaps that is all we should look for in this domain we call personality: perhaps conventional personality refers to nothing but how people see people.

While John French's critical integration of previous factor analyses is needed and may prove very useful, its outcome is discouraging. There are so many alternative ways of slicing the cake of personality. What factors are obtained from a factor analysis depends crucially on what content is put in. While Dr. French's factors may be more comprehensive, they will still be rather arbitrary.

As scientific terms, all factor labels and all trait names are much too vague. It is difficult to keep one factor separate from the next, as Dr. French has found. And one trait blends into the next. Factors and traits are verbal interpretations; all such common nouns have some fuzziness around the edges. Labels for factors and traits lack precise references to any objective behavior, other than to test responses, and each such response is interpretive.

In Dr. Dermen's work, I particularly like the use of separate scores for each pole of the dimensions being investigated. Behavior is full of apparently opposed dispositions, and we need to study their patterning.

One of Dr. Cattell's most important points was made almost as an aside: the meaning of an item changes with the population tested. We don't have items which are transferable from one population to another. Dr. Cattell implies that we will eventually have such items. I am sure that we will never have them. In the work of my research program and in published work by others, it is clear that an item has a different personal meaning for each subject reaponding to it.

More fundamentally, Dr. Cattell and I disagree on the metaphysics of personality. He seems to believe that self-report questionnaires can help us find out what the one underlying structure of personality really is. I don't believe that there is such a single structure to be found. All we are studying is the way people construe their perceptions of other people and of themselves. In individual difference work, almost all personality data are verbal statements, almost all personality data are the labelling or the interpretive observations of someone. On almost no personality data do observers agree perfectly with each other. Almost no personality data involve discrete, separate behavioral acts.

So let us be clear about what we are doing. We are not studying the underlying reality, the behavior of people; we are studying the way people summarize their experiences with other people. This distinction is more than pedantic carping. The large step between behavior and what we study has been brought out by an anthropologist who has been doing psychological research. D'Andrade has shown that when a set of behaviors are scored from immediate, direct observations, their intercorrelations are much lower than those between ratings made after observing the behaviors, i.e., from memory of what

was observed a few minutes earlier. Moreover, the pattern of intercorrelations among the latter ratings, made after the observation period, approximates all too closely the pattern obtained quite independently from similarity judgments, when subjects are asked to indicate how similar each behavioral disposition is to every other one.

All self-report questionnaires and most other personality data call on an observer's memories. Usually, these are memories of events long past, not just memories of experiences occurring a few minutes ago. Such data are not even derived from interpretations of single acts. Each datum, each observer's response, is an interpretation of memories which have had considerable time to be transformed from the original perceptions. We need an explicit theory of the process by which a person summarizes, in the form of attributions, his experiences and perceptions of himself and others, and the process by which he stores and retrieves those attributions.

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